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10/676,105	10/02/2003	Charles Frederick Brucker	50103-560	8401

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EXAMINER

MCDONALD, RODNEY GLENN

ART UNIT PAPER NUMBER

1753

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/676,105

Applicant(s)

BRUCKER ET AL.

Examiner

Rodney G. McDonald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-12,16-21,25 and 26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5-12,16-21,25 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 5, 7-10, 12,16-18, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada (Japan 05-311425) in view of Zejda (U.S. Pat. 5,22,968).

Yamada teach in Figure 1 a method and apparatus for producing a film in a chamber 1 to be maintained at a reduced pressure by exhaust port 2. (See Machine Translation 0009) A target can be present in the chamber for sputtering. (See Machine Translation 0009) A gas supply means 3 for injecting a gas into the chamber is present which extends into the chamber and comprises a plurality of different size holes 5A, 5B,

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5C and 5D. (See Machine translation 0009) The reactive gas is supplied through the gas supply means to provide a reactive gas having the same flow rate over the whole range of the vacuum vessel 1. As a result, the composition of the deposition material is deposited on the substrate uniformly. (See Japio Abstract)

Yamada et al. teach that the gas supply means 3 comprises an inlet portion 4 and an outlet portion comprised of a plurality of different sized orifices 5A, 5B, 5C, 5D. The size of the outlets progressively increases with distance from the inlet portion. (See Japio Abstract; Machine Translation 0009; Figure 1 and 2)

The differences between Yamada and the present claims is that the mounting means for positioning the substrate is not discussed, the gas supply having a wishbone shape with the orifices increasing in diameter from the inlet is not discussed, providing a pair of mutually spaced sputtering sources with a pair of wish boned shaped gas supplies is not discussed, the gas supply means being ring shaped with the gas outlet orifices increasing in diameter from the distance of the inlet is not discussed, providing facing targets with a pair of ring shaped gas supplies with the outlets of the ring shaped gas supplies having an increasing diameter from the inlet is not discussed , the outlets facing toward the central space is not discussed and the outlet orifices being circularly-shaped is not discussed and the gas outlets facing the substrate is not discussed.

Regarding the mounting means, Zejda teach in a substrate mounting means that can hold a substrate for coating. (See Figs. 1-4; Column 2 lines 61-63)

Yamada teach a wishbone shape in Fig.1. (See Yamada Fig.1) The diameters of the outlets increase from the inlet. (See Abstract; Machine Translation 0009) As to

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the arcuate shape of the wishbone arms, Zejda recognize in Fig. 4 contouring the shape of the gas supply device 25 or 28 to match the targets and substrate being coated therefore one of ordinary skill would contour Yamada wishbone arms with the circular target and disk when sputtering. (See Fig. 4)

The wishbone gas supply is discussed above. Zejda further teach providing mutually spaced sputtering sources with mutually spaced apart gas supplies to form a sputtered layer on a substrate. (See Fig. 4; Column 1 lines 60-64)

Zejda et al. teach providing a ring shaped gas supply means. (Fig. 4; Column 3 lines 32-34) Yamada already discussed teach providing outlet of the gas supply increasing in diameter from the inlets. (See Yamada discussed above)

Zejda et al. teach providing mutually spaced facing targets with mutually spaced gas ring sources. (See Fig. 4; Column 3 lines 32-34) Yamada already discussed teach providing outlet of the gas supply increasing in diameter from the inlets. (See Yamada discussed above)

Zejda teach that the outlets facing toward the central space. (See Fig. 4)

Zejda shows the outlet orifices to be circular. (See Fig. 4)

Zejda teach that outlet orifices of gas supplies should face the substrate. (See Fig. 3)

The motivation for utilizing a mounting means for positioning the substrate, utilizing the gas supply having a wishbone shape with the orifices increasing in diameter from the inlet, providing a pair of mutually spaced sputtering sources with a pair of wish boned shaped gas supplies, utilizing a gas supply means being ring shaped with the

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gas outlet orifices increasing in diameter from the distance of the inlet, providing facing targets with a pair of ring shaped gas supplies with the outlets of the ring shaped gas supplies having an increasing diameter from the inlet, providing the outlets facing toward the central space, providing the outlet orifices being circularly-shaped and facing the gas outlets toward the substrate is that it allows for increasing the evenness of the coating on the substrate (Zejda Column 1 lines 43-45) and coating with uniformity (Yamada Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Yamada a mounting means for positioning the substrate, utilizing the gas supply having a wishbone shape with the orifices increasing in diameter from the inlet, providing a pair of mutually spaced sputtering sources with a pair of wish boned shaped gas supplies, utilizing a gas supply means being ring shaped with the gas outlet orifices increasing in diameter from the distance of the inlet, providing facing targets with a pair of ring shaped gas supplies with the outlets of the ring shaped gas supplies having an increasing diameter from the inlet, providing the outlets facing toward the central space and providing the outlet orifices being circularly-shaped and facing the outlets toward the substrate as taught by Yamada combined with Zejda because it allows for increasing the evenness of the coating on the substrate and coating with uniformity.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Zejda as applied to claims 1, 5 above, and further in view of Latz (U.S. Pat. 5,167,789).

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The difference not yet discussed is the plurality of outlet orifices facing away from the central space is not discussed. (Claim 6)

Regarding claim 6, Latz suggest that the outlet of the gas supply means be positioned such that the plurality of orifices face away from the central space in the sputtering chamber. (See Figure)

The motivation for having the orifices face away from the central space in the sputtering chamber is that it allows for stable operation of reactive sputtering systems. (Column 2 lines 20-27)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have had the orifices face away from the central space as taught by Latz et al. because it allows for stable operation of a reactive sputtering system.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Zejda as applied to claims 1 and 10 above, and further in view of Hassan et al. (U.S. Pat. 4,270,999).

The difference not yet discussed is the outlet orifices comprising a plug is not discussed. (Claim 11)

Hassan et al. teach a plug in an orifices for controlling the flowrate of gases. (Column 4 lines 20-38)

The motivation for utilizing a plug in an orifice for gas flow is that it allows for controlling the flow rate of the gas. (See Abstract)

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a plug in a gas outlet orifice as taught by Hassan et al. because it allows for control of the flow rate of the gas.

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Zejda as applied to claim 12 above, and further in view of Suzuki et al. (U.S. Pat. 6,627,253).

The differences not yet discussed is where a cobalt based alloy with oxide separated magnetic grains being deposited is not discussed, the cobalt based alloy with oxide separated magnetic grains having 360 degrees of uniformity is not discussed and the magnetic recording medium is not discussed.

Yamada and Zejda discussed above teach how to uniformly deposit reactive films on a substrate. (See Yamada in view of Zejda discussed above) Suzuki et al. teach that sputtering in an oxygen comprising atmosphere can produce cobalt based alloy for a magnetic recording medium where the magnetic crystalline grains are segregated by the oxide. (Column 4 lines 23-25; Column 5 lines 8-28)

Suzuki et al. teach a cobalt based alloy with oxide separated magnetic grains. (Column 4 lines 23-25; Column 5 lines 8-28) Utilizing the technique of Yamada in view of Zejda for reactive deposition one can achieve the 360 degrees of uniformity. (See Yamada in view of Zejda discussed above)

Suzuki et al. teach incorporating the layer in magnetic recording medium. (See Abstract)

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The motivation for depositing a cobalt based alloy with oxide separated magnetic grains, producing a cobalt based alloy with oxide separated magnetic grains having 360 degrees of uniformity and producing the magnetic recording medium with the cobalt alloy is that it allows for a magnetic medium with low media noise, a high S/N ratio and a high reliability to corrosion. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited a cobalt based alloy with oxide separated magnetic grains, to have produced a cobalt based alloy with oxide separated magnetic grains having 360 degrees of uniformity and to have produced the magnetic recording medium with the cobalt alloy as taught by Suzuki et al. because it allows for a magnetic medium with low media noise, a high S/N ratio and a high reliability to corrosion.

Response to Arguments

Applicant's arguments filed 12-22-05 have been fully considered but they are not persuasive.

The 35 U.S.C. 112 rejections have been withdrawn.

In response to the argument that Yamada do not disclose a wishbone shaped gas supply means, it is argued that Yamada teach a U shaped gas delivery means which is similar to the shape of a wishbone with the exception that Yamada's gas delivery device lacks the arcuate feature which would make it a wishbone. The secondary reference to Zejda teach in Fig. 4 that the gas delivery means can be provided with an arc shape in order to match the substrate. Therefore, it is argued that

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Yamada's gas delivery means could be modified to include an arc. (See Yamada and Zejda discussed above)

In response to the argument that there is insufficient motivation to combine Yamada with Zejda, it is argued that the motivation to combine the teachings of Zejda with Yamada is that it allows for increasing the evenness of the coating (i.e. coating with uniformity). (See Zejda and Yamada discussed above)

In response to the argument that there is nothing in Yamada or Zejda that suggest a uniform coating will be achieved wherein the size of the outlet orifices progressively increase with distance from the inlet portion, it is argued that Yamada suggest the composition of the coating will be uniformized as suggested by Yamada's abstract. This is a uniform coating. (See Yamada and Zejda discussed above)

In response to the argument that Yamada nor Zejda teach a ring shaped gas supply means, Zejda teach a ring shaped gas supply means shown in Fig. 4. This cross section shows a ring shaped gas supply means either item 25 or 28. Yamada teach increasing the outlet size from the inlet. (See Yamada and Zejda discussed above)

In response to the argument that the prior art does not teach an arcuate wishbone or ring shaped outlet with outlet orifices progressively increasing in size, it is argued that Yamada suggest that the outlets progressively increasing in size from the inlet. Yamada is modified by Zejda to achieve the wishbone shape. Zejda teach a ring shaped gas delivery means. (See Yamada and Zejda discussed above)

In response to the argument that Hassan et al. is not applicable to teach the plugs because it unrelated to sputter deposition, it is argued that Hassan while not teaching sputtering does suggest controlling the gas flows with plugs. Such gas flow control would be applicable in sputtering because sputtering utilizes gas flow as evidenced by the primary reference. (See Hassan discussed above)

In response to the argument that the prior art does not teach the claimed magnetic recording medium, it is argued that the prior art does teach the claimed product and does suggest the process. However it should be noted that even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claims is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985), MPEP 2113. In this case the product is shown by the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
February 28, 2006